HPRS

CURRICULUM MAP

SUBJECT AREA:	Mathematics	YEAR / GROUP:	10– aimed at grade 9 - 6

BRIEF SUMMARY OF CURRICULUM INTENT

Our main aim in mathematics in HPRS is to give students the best possible chance to enjoy and succeed in mathematics in such a way that will positively impact on their lives post 16. We believe that maths is not only about numbers, equations etc but is about real understanding and we work with students to help them see that by studying mathematics/numeracy they can make a real difference to their future prospects. Maths has a structure that can be learnt through practical applications and we plan lessons to be as "hands-on" and problem solving as possible to increase student participation and self esteem. As enthusiastic teachers we hope to convey our enjoyment of the subject and the fun in the topic in a way that brings the teaching moment into focus.

It is the intent that the mathematics curriculum at HPRS is:-

- A curriculum that is ambitious for all students
- A curriculum that is coherently planned and sequences
- A curriculum that is successfully adapted, designed and developed for students with special educational needs, and/or disabilities
- A curriculum that is broad and balanced for all students

The curriculum delivery in mathematics relies on:-

- Embedding quality teaching a learning opportunities in lessons with increased thinking time planned for students before the need to respond
- Marking in such a way that it is personalised to identify and correct misconceptions in student friendly language
- Assessing progress regularly and reporting this to parents/carers each term
- Comparing student progress with their individual learning profiles
- Supporting student who are struggling to work in the mathematics room by offering 1 : 1 support with a TA
- Monitoring students who are being taught separately from the main cohort by supplying resources to support the staff working towards the Functional Skills qualification with students
- Purposeful questioning provoking discussion within the lessons.

How SMSC and British Values are delivered in this subject
Spiritual – encourage interest in the power of mathematics in everyday life and use spiritual examples to exemplify this – Rangoli patterns in symmetry and tessellation, Fibonacci sequence and the golden ratio etc. Moral – teachers provide good role models on how to interact with each other and students are encouraged to value the contributions of other students without judgement. Handouts and worked examples avoid stereotypes regarding gender, race, sexual orientation etc. Social – students in seating plan to facilitate good working practise, collaboration and the opportunity to work with students from a variety of different backgrounds. Work within the British values of rule of law, individual liberty and mutual respect of each other. Cultural – students are taught methods for mathematics from around the world such as the Singapore Bar Method, the Chinese lattice method of multiplication etc. Students learn about the traditional methods of mathematics which their parents/grandparents/carers may have been taught as part of the "teaching for mastery" initiative.
KEY DATES / NOTES
Assessment will be a mixture of on-going formative assessments and summative assessments at the end of specific topics. Questioning throughout lessons will take place and marking will be timely and detailed. A combination of these, along with teacher judgement, will form a RAG rated entry half termly on the assessment tracker and this will be reported back to parents/carers at the end of each term Assessments will be a combination of Corbett maths past papers, BKSB assessments and AQA past papers

Timing	Key Skills *What pupils are learning to do*	Teaching & Learning Themes & Styles *Topics, Activities, Learning Styles*	Assessment Focus *including dates and suggested assessments and methods of assessment*	Additional Features • Literacy Elements • Curriculum Links • Visits / Events
AUTUMN - 1	Use conventional terms and notations: points, lines, vertices, edges, planes, parallel lines, perpendicular lines, right angles, polygons, regular polygons and polygons with reflection and/or rotation symmetries; use the standard conventions for labelling and referring to the sides and angles of triangles; draw diagrams from written descriptions Apply the properties of angles at a point, angles at a point on a straight line, vertically opposite angles; understand and use alternate and corresponding angles on parallel lines; derive and use the sum of angles in a triangle (eg to deduce and use the angle sum in a polygon, and to derive properties of regular polygons. Measure line segments and angles in geometric figures, including	Angles – angles and lines	-	

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	interpreting maps and scale drawings and use of bearings Apply the properties of angles at a point, angles at a point on a straight line, vertically opposite angles; understand and use alternate and corresponding angles on parallel lines; derive and use the sum of angles in a triangle (eg to deduce and use the angle sum in any polygon, and to derive properties of regular polygons) Derive and apply the properties and definitions of: special types of quadrilaterals, including square, rectangle, parallelogram, trapezium, kite and rhombus; and triangles and other plane figures using appropriate language Apply angle facts, triangle congruence, similarity and properties of quadrilaterals to conjecture and derive results about angles and sides,	Triangles and quadrilaterals		

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	including Pythagoras' Theorem and the fact that the base angles of an isosceles triangle are equal, and use known result to obtain simple proofs Solve geometrical problems on coordinate axes Use conventional terms and notations: points, lines, vertices, edges, planes, parallel lines, perpendicular lines, right angles, polygons, regular polygons and polygons with reflection and/or rotations symmetries: use the standard conventions for labelling and referring to the sides and angles of triangle; draw diagrams from written descriptions. Derive and apply the properties and definitions of: special types of quadrilaterals, including square, rectangles, parallelogram, trapezium, kite and rhombus; and triangles	Congruency and similarity		

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	and other plane figures using appropriate language. Use the basic congruence criteria for triangles (SSS, SAS, ASA, RHS) Apply angle facts, triangle congruence, similarity and properties of quadrilaterals to conjecture and derive results about angles and sides, including Pythagoras' Theorem and the fact that the base of angles of an isosceles triangle are equal, and use know result to obtain simple proofs. Apply the concepts of congruence and similarity, including the relationships between lengths in similar figures. Use conventional terms and notations: points, lines, vertices, edges, planes, parallel lines, perpendicular lines, right angles, polygons,	Polygon angles		

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	regular polygons and polygons with reflection and/or rotation symmetries; use the standard conventions for labelling and referring to the sides and angles of triangle; draw diagrams from written description Apply the properties of angles at a point, angles at a point on a straight line, vertically opposite angles; understand and use alternate and corresponding angles on parallel lines; derive and use the sum of angles in a triangle (eg to deduce and use the angle sum in any polygon, and to derive properties or regular polygons) Order positive and negative integers, decimals and fractions, use the symbols ≥ ≤ ≠ = Apply the 4 operations + - x ÷ including formal written	Number – place value		

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	methods, to integers, decimals and simple fractions (proper and improper) and mixed numbers – all both positive and negative; understand and use place value (eg when working with very large or very small numbers, and when calculating with decimals) Round numbers and measures to an appropriate degree of accuracy (eg to a specified number of decimal places or significant figures) use inequality notation to specify simple error intervals due to truncation or rounding Apply the four operations + - x ÷ including formal written methods, to integers, decimals and simple fractions (proper and improper) and mixed numbers – all both positive and negative; understand and use place value (eg when working with very large	Rounding Adding and subtracting		

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	or very small numbers, and when calculating with decimals) Apply the four operations + - x ÷ including formal written methods, to integers, decimals and simple fractions (proper and improper) and mixed numbers – all both positive and negative; understand and use place value (eg when working with very large or very small numbers, and when calculating with decimals) Recognise and use relationships between operations, including inverse operations (eg cancellation to simplify calculations and expressions) use conventional notation for priority of operations, including brackets, powers, roots and reciprocals Use and interpret algebraic notation including:	Multiplying and dividing Expressions – terms and expressions		
AUTUMN - 2				

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	- ab in place of a x b - 3y in place of y + y + y and 3 x y - a^2 in place of a x a, a^3 in place of a x a x a, a^2b in place of a x a x b - a/b in place of a ÷ b - coefficients written as fractions rather than as decimals - brackets - Substitute numerical values into formulae and expressions, including scientific formulae - Understand and use the concepts and vocabulary or expressions, equations, formulae, identities, inequalities, terms and factors Simplify and manipulate algebraic expressions by : - Collecting like terms - Multiplying a single term over a bracket - Taking out common factors	Simplifying expressions		

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	- Simplifying expressions involving sums, products and powers, including the laws of indices - Expanding products of 2 binomials - Factorising quadratic expressions of the form $x^2 + bx + c$, including the difference of 2 squares Simplify and manipulate algebraic expressions by : - Collecting like terms - Multiplying a single term over a bracket - Taking out common factors - Simplifying expressions involving sums, products and powers, including the laws of indices - Expanding products of 2 binomials - Factorising quadratic expressions of the form $x^2 + bx + c$, including	Indices		

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	the difference of 2 squares Use and interpret algebraic notation, including - ab in place of a x b - 3y in place of y + y + y and 3 x y - a^2 in place of a x a, a^3 in place of a x a x a, a^2b in place of a x a x b - a/b in place of a ÷ b - coefficients written as fractions rather than as decimals - brackets Understand and use the concepts and vocabulary of expressions, equations, formulae, identities, inequalities, terms and factors. Simplify and manipulate algebraic expressions by - Collecting like terms - Multiplying a single term over a bracket - Taking out common factors	Expanding and factorising		

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	- Simplifying expressions involving sums, products and powers, including the laws of indices - Expanding products of 2 binomials - Factorising quadratic expressions of the form $x^2 + bx + c$, including the difference of 2 squares Interpret and construct tables, charts and diagrams, including frequency tables, bar charts, pie chart and pictograms for categorical data, vertical line charts for ungrouped discrete numerical data, table and line graphs for time series data and know their appropriate use Apply statistics to describe a population Interpret and construct tables, charts and diagrams,	Handling data – organising data Representing data		

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	including frequency tables, bar charts, pie chart and pictograms for categorical data, vertical line charts for ungrouped discrete numerical data, table and line graphs for time series data and know their appropriate use Interpret, analyse and compare the distributions of data sets from univariate empirical distributions through: - Appropriate graphical representation involving discrete, continuous and grouped data - Appropriate measures of central tendency (median, mean, mode and modal class) and spread (range and consideration of outliers) Interpret, analyse and compare the distributions of	Averages and spread		

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	data sets from univariate empirical distributions through: - Appropriate graphical representation involving discrete, continuous and grouped data - Appropriate measures of central tendency (median, mean, mode and modal class) and spread (range and consideration of outliers) Apply statistics to describe a population			
SPRING - 1	Order positive and negative integers, decimals and fractions, use the symbols ≥ ≤ ≠ = Work interchangeably with terminating decimals and their corresponding fractions (such as 3.5 and $\frac{7}{2}$ or 0.375 and $\frac{3}{8}$) Use and interpret algebraic notation, including	Fractions, decimals and percentages		

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	- ab in place of a x b - 3y in place of y + y + y and 3 x y - a^2 in place of a x a, a^3 in place of a x a x a, a^2b in place of a x a x b - a/b in place of a ÷ b - coefficients written as fractions rather than as decimals - brackets Express one quantity as a fraction of another, where the fraction is less than 1 or greater than 1 Recognise and use relationships between operations, including inverse operations (eg cancellation to simplify calculations and expressions) use conventional notation for priority of operations, including brackets, powers, roots and reciprocals. Interpret fractions and percentages as operators.	Fractions and percentages		

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	Apply the four operations + - x ÷ including formal written methods, to integers, decimals and simple fractions (proper and improper) and mixed numbers – all both positive and negative; understand and use place value (eg when working with very large or very small numbers, and when calculating with decimals) Recognise and use relationships between operations, including inverse operations (eg cancellation to simplify calculations and expressions) use conventional notation for priority of operations, including brackets, powers, roots and reciprocals. Work interchangeably with terminating decimals and their corresponding fractions (such as 3.5 and $\frac{7}{2}$ or 0.375 and $\frac{3}{8}$)	Calculations with fractions Fractions, decimals and percentages		

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	Define percentage as " number of parts per hundred"; interpret percentages and percentage changes as a fraction or a decimal and interpret these multiplicatively;' express one quantity as a percentage of another; compare 2 quantities using percentages; work with percentages greater than 100%; solve problems involving percentage change, including percentage increase/decrease and original value problems, and simple interest including financial mathematics Substitute numerical values into formulae and expressions, including scientific formulae Understand and use standard mathematical formulae; rearrange formulae to change the subject	Formulae and function – substituting into formulae		

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	Understand and use standard mathematical formulae; rearrange formulae to change the subject Where appropriate, interpret simple expressions as functions with inputs and outputs Understand and use the concepts and vocabulary of expressions, equations, formulae, identities, inequalities, terms and factors. Know the difference between an equation and an identify; argue mathematically to show algebraic expressions are equivalent, and use algebra to support and construct arguments. Understand and use the concepts and vocabulary of expressions, equations, formulae, identities, inequalities, terms and factors. Simplify and manipulate algebraic expressions	Using standard formulae Equations, identities and functions Expanding and factorising		

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	(including those involving surds) by: - Collecting like terms - Multiplying a single term over a bracket - Taking out common factors - Simplifying expressions involving sums, products and powers, including the laws of indices - Expanding products of 2 binomials - Factorising quadratic expressions of the form $x^2 + bx + c$, including the difference of 2 squares Use scale factors, scale diagrams and maps Use conventional terms and notations: points, lines, vertices, edges, planes, parallel lines, perpendicular lines, right angles, polygons, regular polygons and polygons with reflection	Working in 2D – measuring lengths and angles		

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	and/or rotation symmetries; use the standard conventions for labelling and referring to the sides and angles of triangles; draw diagrams from written descriptions Use standard units of measure and related concepts (length, area, volume/capacity, mass, time, money etc) Measure line segments and angles in geometric figures, including interpreting maps and scale drawings and use of bearings Understand and use standard mathematical formulae: rearrange formulae to change the subject Use standard units of measure and related concepts (length, area, volume/capacity, mass, time, money etc) Know and apply formulae to calculate: area of triangles,	Area of a 2D shape		

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	parallelograms, trapezia, volume or cuboids and other right prisms (including cylinders) Identify, describe and construct congruent and similar shapes, including on co-ordinate axes, by considering rotation, reflection, translation and enlargement (including fractional scale factors) Describe translations as 2D vectors Estimate answers: check calculations using approximation and estimation, including answers obtained using technology Round numbers and measure to an appropriate degree of accuracy (eg to a specified number of decimal places or significant figures) use inequality notation to specify	Transformations Measures and accuracy – estimation and approximation		

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SPRING - 2	simple error intervals due to truncation or rounding Estimate answers: check calculations using approximation and estimation, including answers obtained using technology Round numbers and measure to an appropriate degree of accuracy (eg to a specified number of decimal places or significant figures) use inequality notation to specify simple error intervals due to truncation or rounding Use standard units of mass, length, time, money and other measures (including standard compound measures) using decimal quantities where appropriate Round numbers and measure to an appropriate degree of accuracy (eg to a specified number of decimal places or significant figures) use	Calculator methods Measures and accuracy		

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	inequality notation to specify simple error intervals due to truncation or rounding Apply and interpret limits of accuracy, including upper and lower bounds Change freely between related standard units (eg time, length, area, volume/capacity, mass) and compound units (eg speed, rates of pay, unit pricing, density, pressure) in numerical and algebraic contexts. Use compound units such as speed, rates of pay, unit pricing, density and pressure. Use stand unit of measure and related concepts (length, area, volume/capacity, mass, time, money etc.) Solve linear questions in one unknown algebraically (including those with the unknown on both sides of the	Equations and inequalities – solving linear equations		

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	equation); find approximate solutions using a graph Translate simple situations or procedures into algebraic expressions or formulae; derive an equation (or 2 simultaneous equations), solve the equations and interpret the solution Understand and use the concepts and vocabulary of expressions, equations, formulae, identities, inequalities, terms and factors. Identify and interpret roots, intercepts and turning points of quadratic functions graphically; deduce roots algebraically Solve quadratic equations algebraically by factoring; find approximate solutions using a graph Translate simple situations or procedures into algebraic	Quadratic equations		

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	expressions or formulae; derive an equation (or 2 simultaneous equations) solve the equations and interpret the solution Solve 2 simultaneous equations in 2 variables algebraically; find approximate solutions using a graph Translate simple situations or procedures into algebraic expressions or formulae; derive an equation (or 2 simultaneous equations) solve the equations and interpret the solution Understand and use the concepts and vocabulary of expressions, equations, formulae, identities, inequalities, terms and factors.	Simultaneous equations Inequalities		

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SUMMER – 1	Solve linear inequalities in one variable; represent the solution set on a number line Use positive integer powers and associated real roots Understand and use standard mathematical formulae; rearrange formulae to change the subject Identify and apply circle definitions and properties, including; centre, radius, chord, diameter, circumference, tangent, arc, sector and segment. Know the formulae; circumference of a circle = $2\prod r = \prod D$, area of a circle = $\prod r^2$ Calculate perimeters of 2D shapes, including circles; areas of circles and composite shapes.	Approximate solutions Circles and constructions		

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	Surface area and volume of spheres, pyramids, cones and composite solids Calculate arc lengths, angles and areas of sectors of circles Identify and apply circle definitions and properties, including; centre, radius, chord, diameter, circumference, tangent, arc, sector and segment. Apply and prove the standard circle theorems concerning angles, radii, tangents and chords, and sue them to prove related results Use scale factors, scale diagrams and maps Use conventional terms and notations: points, lines, vertices, edges, planes, parallel lines, perpendicular lines, right angles, polygons, regular polygons and polygons with reflection	Circle theorems Constructions and loci		

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	and/or rotation symmetries; use the standard conventions for labelling and referring to the sides and angles of triangles; draw diagrams from written descriptions Express one quantity as a fraction of another, where the fraction is less than 1 or greater than 1 Define percentage as "number of parts per hundred" ; interpret percentages and percentage changes as a fraction or a decimal and interpret these multiplicatively; express one quantity as a percentage of another, compare 2 quantities using percentages; work with percentages greater than 100%; solve problems involving percentage change, including percentage increase/decrease and original value problems, and	Ratio and proportion		

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	simple interest including financial mathematics Identify and work with fractions in ratio problems Use scale factors, scale diagrams and maps Use ratio notation, including reduction to simplest form Divide a given quantity into 2 parts in a given part; part or part; whole ratio; express the division of a quantity into 2 parts as a ratio; apply ratio to real contexts and problems (such as those involving conversion, comparison, scaling, mixing, concentrations) Express a multiplicative relationship between 2 quantities as a ration or a fraction	Ratio and scales		

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	Understand and use proportion as equality of ratios Relate ratios to fractions and to linear functions Compare lengths, areas and volumes using ratio notation; make links to similarity (including trigonometric ratios) and scale factors Define percentage as "number of parts per hundred" ; interpret percentages and percentage changes as a fraction or a decimal and interpret these multiplicatively; express one quantity as a percentage of another, compare 2 quantities using percentages; work with percentages greater than 100%; solve problems involving percentage change, including percentage increase/decrease and original value problems, and	Percentage change		

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SUMMER - 2	simple interest including financial mathematics Use the concepts and vocabulary of prime numbers, factors (divisors) multiples, common factors, common multiples, highest common factor, lowest common multiple, prime factorisation, including using product notation and the unique factorisation theorem Apply systematic listing strategies including use of the product rule for counting Enumerate sets and combinations of sets systematically, using tables, grids, Venn diagrams and tree diagrams Apply systematic listing strategies including use of the product rule for counting Use positive integer powers and associated real roots	Factors, powers and roots – multiples Powers and roots		

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	(square, cube and higher), recognise powers of 2, 3, 4, 5; estimate powers and roots of any given positive number Calculate with roots and with integer indices; calculate with fractions indices Calculate exactly with fractions, surds and multiples of ∏, simplify surd expressions involving squares (eg √12 = √4 x 3 = √4 x √3 = 2√3) and rationalise denominators	Surds		

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